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(Long version; abbreviated delivery)

Knowledge versus Wisdom

First, let me say how delighted and honoured I am to have this opportunity to make some remarks about the early days of the OECD work on the knowledge societies and on the momentous changes that the unfolding information age is bringing.

And, of course, I am equally pleased to be here in Brazil, which is also on the threshold of knowledge society. Where there has already been considerable experience in the e-business and whose R&D in life sciences, especially the genome research, stands out as an exceptionally high-productive, high-quality work. Another illustrious example is the development of satellite communication system.

Let me now turn briefly to those early days of the OECD's work.

The Early Days and the Lessons

When we started more than a decade ago in the numerous OECD workshops and conferences serious discussions on the new Information and Communication Technologies (ICTs) and Global Information Society (GIS), it was Professor Christopher Freeman who reminded us of T.S. Eliot's words: "Where is the wisdom we have lost in knowledge? Where is the knowledge we have lost in information?"

We were suddenly caught up in a net of new technology that was changing with enormous velocity. One of the experts told us that "you ain't seen nothing yet".

The OECD experts groups reported from the "front" that the new ICTs are a fundamental driving force for the globalisation of industry and services and for the restructuring of the OECD economies.

Sometimes it felt like all this was akin to "Jurassic Park". Something is out there, something unknown, something stupendous... and that something should be done, something to create a balance, to save the nation-state, to settle the struggle between government and the global marketplace...

In February 1995 the Group of Seven held an information society conference in Brussels. It was a media event and created perhaps new policy awareness of the ICTs issues, some already bordering the euphoric. Many sceptical, slow-moving, Europeans described it as "High Mass".

Meanwhile, the serious OECD work started showing that the implications of GII-GIS cover both economic sectors and social policy domain and that it would cause deeper structural changes than was realised.

For such broad and far-reaching changes, the groundwork needed to be laid without delays. It was, therefore, vital that governments ensure close inter-working between different ministries and agencies – and forget their bureaucratic turf fights. This was not only a reaction to the upcoming "ICTs revolution". **It was a pre-requisite.**

During these discussions we were asking, to what extent governments were lagging behind industry, to what extent were they able to go through the required cultural change and get rid of "bureaucanarchy" and become more client-oriented.

Were the governments capable of acting as a catalyst and as a facilitator in the push toward the required regulatory reform? Or was it the private sector that would be expected to take the leading role in building the GII and the NIIs (National Information Infrastructures) of the future? Would business stay global and politics local forever?

We were facing the slow-moving public mind and the fast-moving corporate world.

One of the preoccupations of many panel discussions was about removing barriers to the competitiveness of the SMEs, which were beginning to network through computer systems, becoming more innovating and having exceptional job creating capacity.

Sometimes I had a feeling that discussions were dominated by a cyber-elite, and the public administration or political parties were not equipped to deal with this new fora. And that wired people might be soon better informed than their governments and their politicians. Consequently, a common vision among the OECD countries was lacking, reflecting a variety of different country perceptions of the ICTs "revolution".

The ICTs were the tail wagging the dog.

We all agreed that the OECD was best equipped to do something about both.

In the 1995 Toronto meeting on the economics of the information society it was realised that we needed much more substantive academic research with new data-sets, benchmarks and indicators. Otherwise, we would look like those blind men trying to feel what kind of an animal that elephant was. After all, we all know that if you see a tusk sticking through your tent, you at least assume there an elephant outside.

Anyway, the OECD was facing an enormous challenge in consolidating international database. There were, for instance, severe limitations of education data available for sustaining analysis. In other words, the action was based more on collective intuition and some politicians' visions than solid economic analysis.

It was important to develop measurements that were policy-relevant and comprehensible to political decision-makers and the general public, in order to understand the real economic and social impacts of the knowledge society. It was even hoped that government officials would also become market innovators and imagineers.

With the growing need to think in holistic terms, the OECD produced, as the result of several workshops, major state-of-the-art reports with policy recommendations.

At this point I can tell you a story of hope I heard in our 1995 Vancouver meeting:

"There was this doctor from a big Canadian city who was travelling across the Arctic tundra with an Inuit guide.

In the midst of a dreadful winter storm on a cold and lonely Arctic night, the doctor cried out: "We are lost!" The Inuit guide looked at him calmly and said: "We are not lost. We are here".

In that same meeting in Vancouver the Canadian Minister of Industry told us that "we are surrounded by insurmountable opportunities".

Meanwhile, some people never felt that they were lost.

Only five years ago there were many who saw the world according to Bill Gates:

"A networked world will make people wealthier, happier, healthier and more sociable. The world will be safer, more efficient. Above all, the world will be 'smart'. The brain, the smart part, will be the network itself.

The 'imperfections' and inefficiencies of the market will virtually disappear. Total communications will give us 'friction-free capitalism'."

At the same time some of the politicians kept on running far ahead with their grand visions for the GIS, leaving economists and experts behind to find out and explain what the implications really are, what are the policy solutions to cover social consequences and possible damages, how to deal with the coming period of deep economic dislocations and, finally, **how to implement all those visions.**

Even earlier, in 1995, Felix Rohatyn of the Wall Street made an eerie comment:

" What is happening is a huge transfer of wealth from lower skilled, middle-class American workers to the owners of capital assets and to a new technological aristocracy with a large element of compensation tied to stock values."

There was a new post-industrial corporate world emerging. There were entrepreneurs who said that that they keep on running faster and faster just to stay ahead. And they did not care which way they were running. The point was to stay mobile, and to innovate and to create on the way.

The dotcoms, B2C, B2B and the markets

And then came the dotcoms. Cybercities and cyberports were being built on bits and bytes in almost every township from North America and Europe to the Far East. Attractive college-like incubation environments were created targeting clever teams of entrepreneurs and leading-edge IT companies.

And then "e-commerce" was started in the new cyberspace.

A landmark conference "Dismantling the Barriers to Global Electronic Commerce" was held in Turku, Finland, in November 1997. It drew together policy makers and private-sector leaders. Nokia's CEO, Jorma Ollila, told the participants that the 3G wireless communication will provide a new platform also for e-commerce.

During those days an OECD initiated Sacher report assumed that e-commerce will take a position of major economic importance in the near future, and that the consequences will be dramatic for business endeavours of all kinds. A new commercial sphere was seen emerging that will modify traditional market behaviour and promote new global commercial activities.

It was also seen that new technology should be used to protect consumers and to help bolster confidence in the cybermarket. Already the early workshops had found out that if the security issues were not resolved, the **trust** in e-commerce will disappear and the **public confidence** will be eroded. As a result, the OECD started the work to produce consumer protection guidelines.

There were also questions raised asking, will the taxpayers now disappear to the cyberspace, how can you verify the identity of taxpayers, how can the governments have an access to encrypted information. With the private intra-nets of multinational enterprises the physical location becomes less important creating an additional challenge for tax administrations.

Today, e-commerce, transactions online, is still in its infancy, as the OECD 2002 outlook says. Its growth has been less spectacular than predicted.

Many "old economy" people saw with malicious pleasure how the collapsed internet start-ups had attempted to defy conventional business thinking. Even B2B was given a new meaning in the media

gossips: "back to business basics"; that is to say to the fundamentals of supply versus demand and competition without mindless imitation.

What took place two years ago, was really "information turbulence", as Manuel Castells put it. There were over-hyped technological anticipations and financial markets' gurus, many just young dealers who could not tell the difference between Thailand and Taiwan. It was a chaotic complexity that created a new kind of business cycle.

Today, our background document does not talk any more about e-commerce, but of e-business that is not exclusively conducted online. It consists of a new form of conducting business with various forms of linkages and computer networks. As Manuel Castells says, we are entering the second stage of the new economy with the convergence of financial cycles, innovation cycles and business cycles reinforcing each other.

The dotcoms lost their wisdom also in the sense that they underestimated the behavioural barriers of getting people to buy in the cybermarket. The e-market was also up to a new phenomenon: the capacity of internet to transfer absolute power to the consumers. When it came to new services or products, the business might propose but the public would dispose.

In Europe, the EU Commission had to admit that it made a mistake in concentrating on the technology itself and not on users – who were not ready for the Commissions' "internet revolution". The Commission had not been listening to the early warnings of the OECD/APEC Vancouver meeting where "information superhighway" was already seen alarmingly more supplier-driven than user-driven.

One big test on consumer behaviour will be, of course, the much-hyped Universal Mobile Telecommunications System (UMTS), the "third generation", 3G, service. The auctioning of licenses for the 3G spectrum was in itself an exercise of presumed knowledge versus wisdom.

However, wireless communications will be a cornerstone of the future e-business, too. New wireless communication is also "about creating new freedoms", as Bruno Giussani says in his book **Making Sense of the Wireless Internet**. Using the mobile phone one can already pay bills, trade shares online and soon conduct all the banking services. In the near future the mobile phone might be even able to monitor our health as a stethoscope.

There will be a revival of the B2C e-market, too. As a new type of relationship will be invented between sellers and buyers, customer relationships will be redesigned and buying decisions will change. These changes will be determined by several forces that are economic, behavioural, cultural and institutional.

What is emerging today, however, is the increasing importance of B2B, companies' private exchanges, which connect businesses with their suppliers and partners with new state-of-the-art firewalls to protect sensitive data. With this development there will also be increasing demand for application software for encryption, digital certificates, access controls, etc.

By now we all know that the ICTs have engendered fundamental changes in the way industrial organisations are operating. The network enterprises with high IT applications have new management systems, flat hierarchy, teamwork system and inventory strategies; i.e. they have multi-factor productivity. The new dominant model will be thus decentralised, horizontal and more equally distributed and democratic.

Hierarchy can suppress skills and talents.

ICTs demand non-hierarchical thinking, unlike traditional mechanistic technologies. This might explain why the Finns, living in a non-hierarchical society, are world class Formula One and rally car drivers, as well as snow board skiers where you need daring and swift individual decisions and reactions.

And, of course, companies like Nokia reflect in their management style the Finnish culture. These companies have adjusted themselves to the ways the information society operates – from symphony orchestra model to jazz band model. In the music performed by a symphony orchestra we know what

happens next. A jazz band, on the other hand, improvises and creates in its sessions constantly something new while keeping on playing and jamming.

Of course, one can always ask, does a global company like Nokia need any more its home country. To this question Nokia's Chairman Jorma Ollila responded once: "Nokia's corporate culture, its underlying ethos and the strength of its product are Finnish".

I think it is also important to keep in mind that national culture and traditions do not have to disappear into the cyberspace.

The dotcom "bubble" created not only some fascinating new businesses and interesting experiments, but it also produced more rapid transformation of existing businesses. And productivity gains from the ICTs are likely to continue to spread around the economy as a whole.

New innovations will continue to pour forth with more mature business models. As **The Economist** put it last month: "It may not be long before some teenager in a garage invents the next killer application."

And finally, there is **bioinformatics**, a mixture of genomics and new powerful computers hunting down genetic fingerprints of various diseases. Bioinformatics has a potential to halve the current costs of drugs. New small biotech companies which are specialising in DNA chip technology with their e-business networks will soon achieve such a market size that it is easy to imagine a new bioinformatics "Nokia" soon emerging from nowhere.

To sum up, the diffusion of ICTs throughout the economy has enhanced economic efficiency and substantially boosted productivity growth. Despite the short-term turbulence, prospects for the industry remain strong, as stated in the OECD IT Outlook 2002.

The Social Impact

The impact of the ICTs on the economy, and on society have been pervasive, enormous and global. ICTs have been re-structuring even governments to the extent that some are asking, is this the end of national government and the beginning of virtual communities inhabited by "netizens".

In the new knowledge-intensive economy companies, governments and individuals all must network. None can operate alone any more. An early bird might get a worm in the Net, but soon it will need other companies. Knowledge is still power, but in the Net world shared knowledge and shared vision are real power. And with knowledge wisdom will be sustained.

Numerous OECD analysis and symposiums increased the understanding of the dynamics of the knowledge-based economy, knowledge networks and national innovation systems.

But the biggest impact has been perhaps on the individual.

The emergence of Information Workers has created within firms new competitive teams that require new abilities to learn. Modern firms no longer hire educated people, rather they hire talented people, flexible knowledge workers, those who learn through networking and through collective learning processes in a multidisciplinary environment. In this environment everybody learns from everybody else.

While the work is no longer a place, firms themselves have become learning organisations, continuously adapting the management to accommodate new technologies.

The introduction of lifelong learning strategies require flexibility of movement between education, training and work, and new roles for public and private sector institutions.

In the series of critical views on the new IT-based economy, Anthony P. Carnevale and Stephen J. Rose have raised questions in their paper, "Education for What? The New Office Economy", about the required new communication skills, social ease and basic reasoning abilities. They insist that these skills, however general they may seem, may only be possible through higher education, where students are exposed to a sophisticated culture, a variety of experiences, and varying disciplines that require analysis of facts and

concepts.

To learn creativity and spirit of enterprise it was understood already in the earlier OECD meetings that it is crucial to provide early availability of the net for first-graders and their teachers. In strengthening the "knowledge solidarity" it was equally important to provide everyone, at every age, the access to the net.

Digital Divide

It has been said that development without the Internet would be the equivalent of industrialisation without electricity in the industrial era.

There are arguments saying that the Internet is useless in countries where the very basic human needs for decent living are lacking. However, without the technological, organisational and networking capacity of the ICTs you would not have the knowledge and management you need to generate the resources for sustainable development.

After finding out that half the world's population has never made a telephone call, much less accessed the Internet, the OECD has now begun efforts to measure the digital divide and to examine how best to ensure access for citizens, business and regions to new net technologies and services.

But access only is not enough. The minds of people must also be opened to understand the new opportunities offered by the ICTs. The dream is not only about dismantling barriers to the Internet, it is also about breaking barriers that limit our knowledge of the world, our neighbours and ourselves.

The traditional education system must also go through a learning revolution. There are supporters of this revolution who insist that conferences and small discussion groups around computers, surfing the internet, prepare students for the knowledge societies of the future. This will be a world in which most problems, whether scientific or corporate, are addressed by teams. Students prepare papers collectively and they can log onto networks to confer with other students located in foreign countries.

The Internet and wisdom

On the other hand, and remembering what Professor Freeman said, there is a danger in the new web rush that we soon face a cyber generation whose sense of history goes back for about one year.

The Internet is increasingly filled with poor information, distinct from quality information. It might become a source of confusion and create illusions of knowledge. The dry and inhuman information will be confused with worthwhile knowledge if people are not equipped with proper educational background to analyse the information flow from cyberspace.

The fact is that the Net is a very messy information megastore.

We might end up in a world where instead of soul we have membership in the crowd, in the primitive counterculture Internet-tribes who have instead of wisdom, merely data and digits; who are wireless and clueless.

Just as the old passionate and expressive movie-making is also being killed by the new generation digital Hollywood films that only reinforce mass-culture attitudes. Special effects have replaced the creativeness of the artistic cinema.

Today, most young people might not be able to immerse themselves into long, harmonic texts. The remote-control generation does not have the patience to follow one story line for long, everything must move fast. On the other hand, the older generation might not be able to understand the words, pictures and sounds integrated by multimedia.

Even the digital gurus admit that written words spark images and evoke visions that get much of their meaning from the readers' imagination and experiences. When you read a novel by such a great Brazilian writer as **Jorge Amado**, much of colours and sounds of Bahia come from you, the reader.

Hypertexts

Let me now become even more philosophical.

In Manuel Castells' book **The Internet Galaxy** a new communication environment is "subjected to the contradictory dynamics between our dark side and our sources of hope."

The ICTs development, pushing globalisation still threatens to generate a widespread backlash that is a result of "a personal feeling of lack of control, of acceleration of our lives, of an endless race toward unknown goals," as Castells says.

In fact, some ministers were wondering already years ago in the OECD discussion how they would be able to explain to the people, in everyday terms, the seemingly inexplicable and uncontrollable forces that threaten their jobs and their futures.

We can all agree with those who say that the fundamental challenge to our wisdom is the contradiction between our technological over-development and our institutional and social under-development.

The new socially responsible corporate business, together with governments and NGOs, could create a functional network for new co-operation. After Johannesburg it is too early to tell when this will happen.

Castells calls for new forms of social contracts. He also believes that the ICTs can gradually lead to sustainable development strategy.

In Castell's Galaxy, information and knowledge are built around the concept of the hypertext and multimedia. The hypertext is an interactive system, "digitally communicated and electronically operated in which all the bits and pieces of cultural expression, present and past, and future, in all their manifestations, could coexist and be recombined."

The amount of information flow in cyberspace is overwhelming. There are now about 550 billion documents on the web, growing at the rate of 7.3 million web pages per day. And we still do not know how long these digital texts last, as we do with paper.

To adjust the hyperlinks or hypertexts to your needs, the web itself should become intelligent. New cyberspace gurus suggest that thinking computers could bring us enlightenment, prosperity and more leisure time. In fact, they say, the Internet could become a "Global Brain": something that controls, monitors and directs most of what goes on in human society. And even more scary, the Internet could start to control itself. Welcome, new Hal 9000 of the "Space Odyssey"!

Finally, Castell insists that the hypertext is inside us. In personalised hypertexts there are bridges of communication, **the most important being art**, in all its manifestations. To Castells art has always been a tool to build bridges between people from different cultures.

The following quote from **The Internet Galaxy** is very fitting also for my theme "Knowledge versus Wisdom":

"In a world of broken mirrors, made of non-communicable texts, art could be, without any deliberate agenda, just by being, a protocol of communication and a tool of social reconstruction."

Still, it is critical to equip people with the ability to analyse the endless information flowing from the cyberspace. The present technology does not seem to help them to do this.

The New Networks

In the early OECD workshops it was also foreseen that totally different, totally new interest groups will now start communicating globally online, networking globally and emerging as new types of NGOs, new major players in future negotiations. In my old meeting minutes I asked then: "We do not know how powerful they will be, but they will be a powerful new factor in any international negotiations or discussions, in particular around discussions on GII and globalisation."

Well, we have now seen this power demonstrating itself in various forms.

Manuel Castells describes this phenomenon today in the following way: "The anti-globalisation movement is not simply a network, it is an electronic network, it is an Internet-based movement. And because the Internet is its home, it cannot be disorganised or captured. It swims like fish in the net."

After the 11th of September, 2001, we have realised that there are also groups of terror networking and swimming in the cyberspace.

If you still want to get out of this new cyberspace, it is already too late.

The final conclusion of Manuel Castells is that as long as you want to live in society, you have to deal with the network society, "because we live in the Internet Galaxy".

Besides, the OECD IT Outlook 2002 tells us that also a number of countries have ambitious plans to become world players in the cyberspace. One wishes to become "the world's most connected country," one "the world's most advanced IT nation within five years," one "a world leader in the knowledge economy," one claims to be already the "micro cosmos of the cyberspace," etc.

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